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ABSTRACT

This report contains abstracts of 20 selected research studies related to individuals working as a group to achieve a goal. Each abstract consists of these components: author(s) or researcher(s); title; source (journal citation); purpose of the research; participants; method; results; and discussion. In general, the studies show that working in groups can improve the performance of individuals and the group. The report is intended to help guide human resource development professionals in their efforts to design more productive work systems. (YLB)

Working in Groups: Selected Research Abstracts

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Training and Development

Research Report

A report completed as part of the Synchonous Work Group Research and Development Project

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Much has been reported in the popular and scholarly literature about working in groups in organizations. Of all the efforts to increase productivity and improve quality, none seems to hold more interest among managers and workers than this work design. Work groups are an approach to work in which workers share responsibility and accountability to complete a product or service that meets customer requirements. Use of work groups has resulted in positive outcomes for organizations and workers. Organizations have reported fewer defects, lower unit costs, and increased workforce efficiency. Workers have reported increased feelings of accomplishment, greater involvement with the goals of the organization, and increased potential for self-development.

This report addresses a practical question that is frequently asked: "What are the critical features of work groups?" This question was addressed by reviewing the literature related to individuals working as a group to achieve a goal. In general, the studies show that working in groups can improve the performance of individuals and the group. The report was prepared to help guide human resource development professions in their efforts to design more productive work systems.

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Erez, M., & Zidon, I. (1984). Effect of goal acceptance on the relationship of goal difficulty to performance. *Journal of Applied Psychology, 69*(1), 69-78.

Purpose	To determine the impact of goal acceptance and difficulty on group performance.
Participants	140 technicians and engineers.
Method	Participants were instructed to complete a perceptual speed test requiring them to determine how many digits or letters in a row were the same as the circled one to the left of each row. Performance was measured by the number of numerals and characters correctly circled within an allotted time period.
Results	The results were as follows: ▪ Performance increased with goal difficulty in the high and medium-goal acceptance groups. ▪ Performance decreased as goals became more difficult in the low-goal acceptance group. ▪ Goal acceptance decreased with goal difficulty for all groups.
Discussion	The results demonstrated the relationship between performance level and goal difficulty when goals are accepted and rejected. Goal difficulty offers a frame of reference for evaluating how people respond to different goal situations.

Latham, G., & Yukl, G. (1976). Assigned versus participative goal setting with educated and uneducated wood workers. *Journal of Applied Psychology, 60*(3), 299-312.

Purpose	To study the effects of participative and assigned goal setting in work groups.
Participants	48 logging crews in the wood industry.
Method	Organization managers were told that a method had been found which that allow them to increase their productivity at no cost to them or their workers. Participative and assigned work groups were established. Participative work groups asked their employees each week to set a specific production goal in terms of cunits (100 cubic feet of wood per week) for a eight week period). Assigned work groups were given the production goal.
Results	The results were the following: ▪ Performance was higher in the participative goal-setting condition than in the assigned or "do your best" goal-setting conditions. ▪ Goal difficulty was higher in the participative goal-setting condition than in the assigned goal-setting condition. ▪ Goal achievement occurred more often in the participative goal-setting condition than in the assigned goal-setting condition.
Discussion	The results suggest that participation affects performance when there is the establishment of and the commitment to specific goals. The superiority of participative goal setting is due in part to a higher goal being set by the logging crews. The acceptance of goals and the motivation to attain those goals is greater when employees are allowed to participate in the goal setting process.

Matsui, T., Kakuyama, T., & Uy Onglatco, M. (1987). Effects of goals and feedback on performance in groups. *Journal of Applied Psychology, 72*(3), 407-415.

Purpose	To determine 1) whether people would perform better when the performance standard was group output rather than individual output and 2) whether group goal-setting would lead to higher performance than individual goal setting when goal acceptance is higher.
Participants	In Study 1, 104 college men and women. In Study 2, 100 college men and women.
Method	In Study 1, team members were told to specify the score their team would achieve and then discuss the score each member would contribute to the group goal on a numerical counting task. In Study 2, team members were asked to sit together on a similar numerical counting task, and were informed of their team's ability. They were told that there would be a trial lasting 15 minutes, with the goal of completing 160 rows as a team.
Results	The results were the following: ▪ In Study 1, group-goal participants performed higher than individual-goal participants, who had higher goals. Goal acceptance was higher for group-goal participants than for individual-goal participants. ▪ In Study 2, although participants worked together as teams, individual team-member data were gathered. Post-feedback performance was higher than pre-feedback performance suggesting that task feedback enhances performance. Higher ability subjects maintained their motivation although they learned their lower ability partners were performing poorly.

Discussion

The results showed that feedback on both group and individual performance data maximizes efforts. Having members work as teams with a specific team goal, rather than as individuals with an individual goal, increases productivity.

Koch, J. (1979). Effects of goal specificity and performance feedback to work groups on peer leadership, performance, and attitudes. *Human Relations, 32*(10), 819-840.

Purpose	To examine how goals and feedback in work teams relates to leadership, group effectiveness, performance, and attitudes.
Participants	78 female piecework operators.
Method	A questionnaire was administered to all participants approximately seven months before goal setting and feedback programs. Plexiglas display boards were used to show performance data to five subassembly groups, who had been identified by operators in "natural" work units. The criterion measure for assessing the overall effectiveness was the amount of "seconds due to sewing" a garment (for example, time on overall task) for each subassembly group in the entire plant.
Results	The results were the following: • The nominal grouping of operators into subassembly teams and the implementation of specific goals and regular feedback enhanced the social and task-related interactions and performance of operators. • Increasing feedback and goal specificity served as a clear focus for group performance improvements.
Discussion	Though feedback and goal specificity may not improve work attitudes, use of goals and feedback substantially improved performance. Feedback was useful for initiating group concepts because it enabled operators to predict what was expected of them, stimulating a greater emphasis on goal achievement.

Erez, M., & Arad, R. (1986). Participative goal setting: Social, motivational, and cognitive factors. *Journal of Applied Psychology, 71*(4), 591-597.

Purpose	To study the social, motivational, and cognitive factors of participation on performance.
Participants	96 white collar employees.
Method	Two levels (high, low) and three types of involvement (goal setting, group discussion, and information sharing) were used. Participants evaluated job application forms for specific job requirements. A questionnaire measured perceived social interaction, perceived involvement in goal setting, and perceived amount of relevant information.
Results	• Overall performance was higher in the high-group discussion condition than the low-group discussion condition. • Number of errors corrected was higher in the high-group discussion and high-group involvement conditions than in the low-group discussion and low-group involvement conditions. • Participants performed lower in the combination of low-group discussion, low-group involvement, and low-group information, than the high-group conditions. • The percent recalled was higher in the high-group discussion conditions than low-group discussion conditions. • Goal acceptance was higher in the high-group discussion condition than the low-group discussion condition.

Discussion

Performance, incidental learning, goal acceptance, group commitment and satisfaction were higher for participants in group discussions. Involvement in goal setting had a significant effect on performance, though the level of goal difficulty was constant.

Sorenson, J. (1971). Task demands, group interaction, and group performance. *Sociometry, 34*(4), 483-495.

Purpose	To study task demands, group task behavior, and group performance.
Participants	28 three-man groups of college males.
Method	Two types of intellectual tasks, production and problem-solving tasks, were given to the groups. Five task behaviors were recorded by evaluators. Group products were rated on two dimensions: quality and originality.
Results	The results were the following: ▪ Production tasks led groups to more structuring, generating, and requesting than problem-solving tasks. ▪ Production tasks initiated more requests for information and clarification, due to the higher need to structure tasks. ▪ Problem-solving tasks produced higher quality solutions than production tasks in the areas of task demands and group performance.
Discussion	This study showed the relationship between task behaviors and performance levels on both production and problem-solving tasks. Greater task demands and quality were related to behaviors on a production task. Solution originality was not related to behaviors on a problem-solving task. While the group may be involved in problem solving, task demands may constrain the quality of the solution.

Kabanoff, B., & O'Brien, G. (1979). The effects of task type and cooperation upon group products and performance. *Organizational Behavior and Human Performance, 23,* 163-181.

Purpose	To study the direct and interactive effects of task type and structure on group products.
Participants	24 three-person groups.
Method	Each group performed three tasks while employing one of four work processes. Each task required two levels of coordination (idea contribution and systematic organization of ideas), two levels of collaboration (idea contribution and an unsystematic organization of ideas), and three types of tasks (production, discussion, and problem solving). Each group responded to three critical incidents describing medical workers in a native clinic. After each incident, four possible explanations for the events described were given. Groups selected the most appropriate explanation for each incident and discussed their reasons.
Results	The results were the following: ▪ Collaboration resulted in products with reduced length, originality, issue involvement, adequacy, quality, and creativity. ▪ Coordination resulted in products that were longer, more issue involved, adequate, creative, and higher quality. ▪ Production tasks were performed better by collaborative groups; problem solving tasks were performed at an intermediate level.
Discussion	The results showed that when information is shared, collaboration among group members enhanced performance. Coordinated structures more creative products. Collaborative structures resulted in less adequate products.

Campbell, D., & Gingrich, K. (1986). The interactive effects of task complexity and participation on task performance: A field experiment. *Organizational Behavior and Human Decision Processes, 38,* 162-180.

Purpose	To investigate group participation on performance of a complex task.
Participants	40 entry-level programmers placed in groups.
Method	Groups were asked to design and write an actual computer program. Participants analyzed the problem, designed the program, composed the program code, and tested the program to meet design specifications. The programs were distributed among four supervisors, with each supervisor having a mix of both participation and assignment programs. Two types were identified: simple programs which required 40 hours or less and complex programs which required 40 hours or more.
Results	The results showed that: • Complex tasks involved more discussion and explanation than simple tasks. • Participation under complex task conditions led to better task performance than any other task type and involvement method.
Discussion	Group performance on complex tasks can be improved through participation. Improvements occur as a result of increased quality and quantity of information. The results confirmed the relationship between group participation and task performance under complex task conditions, though not on simple task conditions. Placing more effort into an assigned task may not be sufficient to obtain desired performance levels.

Griffin, R. (1988). Consequences of quality circles in an industrial setting: A longitudinal assessment. *Academy of Management Journal, 31*(2), 338-358.

Purpose	To study the how quality circles affect individuals and the organization.
Participants	73 employees organized into eight quality circles.
Method	This was a field experiment employing repeated measures, with the measures at six months, 18 months, and 36 months. Group members participated in a two-day off-site program on problem solving. The program was followed by group problem solving activities. After each time measure, questionnaires were administered and interviews were conducted.
Results	Scores for the four primary individual-level dependent variables (job satisfaction, organizational commitment, performance, and intentions to quit) improved gradually up to the 18 month mark, but subsequently decreased to their initial baseline levels. The groups were considered successful for the individuals and organization for about two years, but then performance declined to initial baseline levels.
Discussion	Though performance ratings were at their highest level toward the latter portion of the program, effectiveness of quality circles declined to their original level of performance after program termination. The results suggest that quality circles must have a management system to monitor changes in quality circle performance so that exemplary performance is maintained, not eliminated.

Marks, M., Mirvis, P., Hackett, E., & Grady, J., Jr. (1986). Employee participation in a quality circle program: Impact on quality of work life, productivity, and absenteeism. *Journal of Applied Psychology, 71*(1), 61-69.

Purpose	To study employee participation, quality of work life, productivity, and absenteeism in a quality circle program.
Participants	109 workers in a manufacturing company.
Method	Fifty-three of the 109 eligible employees elected to participate in the program and were trained and placed into one of six quality circles. The groups met one hour per week to solve work-related problems. Nominal groups, brainstorming, cause-effect analysis, and fishbone problem analysis flow charts were used groups. A questionnaire was administered to participants and nonparticipants after two years of program implementation.
Results	The results showed that productivity improved for participants during the 24 month period following implementation of the program. Improvements were noted in: percentage of hours spent on production, plant efficiency rates, and hourly productivity rates.
Discussion	The results indicated how participation in quality circles affects attitudes and employee productivity. The results support the conclusion that participants perform produce at a higher rate than non-program participants.

Buller, P., & Bell, C., Jr. (1986). Effects of team building and goal setting on productivity: A field experiment. *Academy of Management Journal, 29*(2), 305-328.

Purpose	To study the effects of team building on the development of group strategies.
Participants	53 miners in an underground metal mine.
Method	36 miners were assigned to undergo team building in order to work in a stope (a group of miners who work together in a small underground area): 12 stopes were assigned for the team building condition, while the eight remaining stopes were assigned to the non-team building condition. Productivity was the unit of analysis. Stope miners and their shift bosses set specific, difficult, and attainable goals for tons per manshift and grades of ore collected for three months. Miners and bosses established mutually agreed upon goals that met the stated criteria. Shift bosses provided weekly feedback sheets to miners in the goal-setting condition.
Results	The results showed that team building had a positive effect on the grades of silver and lead collected. Goal setting improved tons per manshift collected. Structured interviews showed that the miners preferred the team-building and goal-setting interventions. Interviews showed that most miners expressed ideas to management openly. Miners mentioned that the feedback helped them increase the quality of ore collected.
Discussion	The findings showed that goal setting and feedback can serve as important ways to influence group performance. Miners who received feedback on their goals did not necessarily work harder than miners who did not receive feedback on their goals. However, they did report using more appropriate ways to attain the task.

Latham, G.P., & Marshall, H.A. (1982). The effects of self-set, participatively set, and assigned goals on the performance of government employees. *Personnel Psychology, 35,* 399-404.

Purpose	To study assigned versus participative goal setting.
Participants	57 supervisors in a government agency.
Method	All participants were told that a job analysis was being conducted to define effective supervisory behavior. Each participant brainstormed job behaviors that made the difference between effective and ineffective job behavior as a supervisor. Goals were set for the number of behaviors written within a 20 minute period.
Results	There was no difference in goal difficulty between participative goal-setting and individual goal-setting. Goal difficulty was held constant between the participative and assigned goal conditions by imposing a goal agreed upon by an employee in the participative condition upon an employee in the assigned condition. There was no difference among the three goal-setting conditions in goal acceptance or performance.
Discussion	Previous research has shown that specific and difficult goals lead to higher performance levels. These results support the notion that the process used to set goals may be as important as the goals themselves.

Bottger, P.C., & Yetton, P.W. (1987). Improving group performance by trai ing in individual problem solving. *Journal of Applied Psychology*, 72(4), 651-657.

Purpose	To study how training improves individual group members' use of task knowledge.
Participants	169 managers and 207 MBA students working in 80 groups.
Method	The task was the "Moon Survival" problem, which required participants to imagine themselves crash landed on the moon 200 miles from the home base. Participant interviews confirmed that the exercise was perceived as testing task knowledge and small group discussion skills.
Results	Group performance was perceived to be better than individual performance on problem solving. The results also showed that individual problem solving complimented the group problem solving. The results support the notion that group performance is strongly influenced by individuals' task ability.
Discussion	Individual performance improved group performance on problem-solving. In addition, by training the participants in effective search and evaluation routines prior to assembling in groups, individuals use of task knowledge was upgraded and team achievement was enhanced.

Tang, T.L., Tollison, P.G., & Whiteside, H.D. (1987). The effect of quality circle initiation on motivation to attend quality circle meetings on task performance. *Personnel Psychology, 40,* 799-813.

Purpose	To study motivation to attend quality circle meetings and task performance.
Participants	47 quality circles in an assembly plant.
Method	Four variables were examined, quality circle: attendance rate, ability to solve problems, and member performance.
Results	The results were the following: ▪ peer quality-circle initiation resulted in higher attendance at meetings than attendance at management quality-circle initiations. ▪ higher attendance rate was shown in meetings associated with a low quantity of projects, but higher project completion rates.
Discussion	How organizations initiate quality circles influences the future behavior of group members. Peer quality-circle initiation resulted in higher attendance. Management quality-circle initiation resulted in lower attendance. How to influence employees to initiate quality circles remains an issue in many organizations.

Hall, J., & Williams, M.S. (1970). Group dynamics training and improved decision making. *Journal of Applied Behavioral Science, 6*(1), 39-68.

Purpose	To study how training on the decision-making process affects group performance.
Participants	377 individuals, formed into 60 groups.
Method	30 groups trained in group dynamics were compared with 30 untrained groups in their performance on the "Twelve Angry Men" decision making task. Three different populations of decision makers were studied: college students, managers, and psychiatric workers.
Results	Trained groups consistently performed more effectively than untrained groups on measures of decision quality, use of resources, and creativity.
Discussion	The importance of this study is somewhat limited by the special nature of the task and by the possible extraneous factor of using participants from different populations. The results demonstrated that group performance was improved under the trained conditions versus the untrained condition.

Pritchard, R.D., Jones, S.D., Roth, P.L., Stuebing, K.K., & Ekeberg, S.E. (1988). Effects of group feedback, goal setting, and incentives on organizational productivity. *Journal of Applied Psychology, 73*(2), 337-358.

Purpose	To measure productivity for complex jobs and analyze differences between group-level feedback, goal setting, and incentives.
Participants	85 service personnel at an Air Force base.
Method	The method consisted of a baseline period of eight to nine that was followed by a five month period of feedback based on the Productivity Measurement and Enhancement System (ProMES). Goal setting was added to feedback for five months. Incentives, which included time off from work, were also added to feedback and goal setting after another five months.
Results	The results were the following:

- Group-level feedback increased productivity an average of 50 percent over baseline.
- Group-goal setting increased productivity 75 percent over baseline.
- Group incentives increased productivity 76 percent over baseline.
- Control group data showed only a slight increase in productivity over the same period, and the performance level of personnel either stayed the same or decreased.
- Job satisfaction, turnover intentions, and morale, were as good or better following the interventions.

Discussion

The results demonstrated the importance of feedback for groups in organizations where there are rapid technological or market changes. However, it is unclear how much participation is actually necessary for developing effective group feedback systems.

Libby, R., Trotman, K.T., Zimmer, I. (1987). Member variation, recognition of expertise, and group performance. *Journal of Applied Psychology, 72*(1), 81-87.

Purpose	To study the variation in group performance to recognize expertise among group members.
Participant	60 loan officers in banks and finance companies.
Method	A task was distributed to individuals who completed the task independently. Individuals then were assigned to three-person, prior to receiving feedback on their individual performance. Participants then completed the same task as a group. Ability to recognize expertise was measured by the perceptions of group members compared to actual individual performance and judgments about who was the most influential member.
Results	Expert loan officers serving in groups performed as well as the most influential individuals. Whether a particular group outperformed or underperformed its composite could be explained by variation in group members' performance and ability to recognize differential expertise.
Discussion	The results suggest that the ability to recognize expertise and the variation in individual performance are major determinants of group. Ability to recognize expertise and variations in individual expertise are affected by the type and complexity of the task. The results also suggest that the type of task will affect performance.

Hollenbeck, J.R., & Brief, A.P. (1987). The effects of individual differences and goal origin on goal setting and performance. *Organizational Behavior and Human Decision Processes, 40,* 392-414.

Purpose	To study how individual differences and goal origin affects goal setting and performance.
Participants	102 college students.
Method	Participants solved a set of anagrams in groups of six to eight. They were given a one minute practice trial to unscramble as many as possible. The total time for the experiment was ten minutes.
Results	The results were as follows: ▪ In self-set goal condition, self perceptions were related to the difficulty of the goals selected, with more difficult goals set by individuals having higher perceptions of their ability. ▪ In assigned-goal conditions, there was a relationship between selection of goal difficulty and performance on the task, for participants having high self-esteem.
Discussion	The findings suggest that for groups high in self-esteem, more difficult goals serve to increase perceptions of task-specific ability, which in turn enhances performance.

Hollenbeck, J.R., & Williams, C.R. (1987). Goal importance, self-focus, and the goal setting process. *Journal of Applied Psychology*, 72(2), 204-211.

Purpose	To study the effects of goal importance and self-focus on goal-setting.
Participants	143 salespersons in a department store.
Method	The study used three data collection methods to examine the importance of goals for salespersons: archival records, questionnaire responses, and a policy-capturing exercise.
Results	The results showed that perceived past performance on goals was much stronger for high self-focused salespersons than for low self-focused salespersons.
Discussion:	The results confirm that perceptions of past performance influence future performance and, thus, might be a good predictor of actual performance.

Garland, H. (1983). Influence of ability, assigned goals, and normative information on personal goals and performance: A challenge to the goal attainability assumption. *Journal of Applied Psychology, 68*(1), 20-30.

Purpose	To show how information about assigned goal difficulty affects the goals individuals set for their own performance.
Participants	58 undergraduate students.
Method	Participants were assigned to one of six conditions representing two levels of goal difficulty (easy versus difficult) and three levels of normative information. Participants set goals on a creativity task, which was performed over ten repeated trials. Participants then selected whether they wanted to continue working on more trials.
Results	The results were the following: ▪ Personal goals were influenced by assigned goals, but ability had not related to personal goals. ▪ Information did not influence personal goals directly, but did interact with assigned goals. ▪ Assigned goals and ability affected performance. ▪ Assigned goals influenced performance, indirectly through their influence on personal goals and directly through personal goals assigned at a difficult level.
Discussion	The results were consistent with other studies that showed specific and difficult goals motivate individuals and groups to achieve higher performance than do easier goals.

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